AMENDMENTS TO THE CLAIMS

1. [Currently Amended] A hybrid scintillation/direct conversion computed tomography (CT) imaging system comprising:

a gantry, wherein said gantry defines a patient cavity and includes an x-ray source and a radiation detection apparatus, wherein said radiation detection apparatus includes a first radiation detector and a second radiation detector and wherein said x-ray source and said radiation detection apparatus are rotatingly associated with said gantry in an X-Y plane so as to be separated by said patient cavity, wherein said first radiation detector is a different type of detector than said second radiation detector, said second radiation detector configured to count attenuated x-rays and measure the energy of said attenuated x-rays;

a patient support structure movingly associated with said gantry in a Z axis substantially transverse to said X-Y plane so as to allow communication with said patient cavity; and

a processing device, wherein said processing device is communicated with said radiation detection apparatus.

2. [Original] The imaging system of claim 1, wherein said first radiation detector is a scintillator/photo-sensor detector and wherein said second radiation detector is a direct conversion detector.

3. [Currently Amended] The imaging system of claim 1, wherein said first radiation detector is disposed so as to be adjacent to said second radiation detector relative to said Z axis.

4. [Currently Amended] The imaging system of claim 1, wherein said first radiation detector is disposed so as to be non-adjacent to said second radiation detector relative to said Z axis and adjacent thereto with respect to said X-Y plane.

5. [Currently Amended] The imaging system of claim 1, wherein said x-ray~~radiation~~ source includes a first x-ray emitter opposingly disposed relative to said first radiation detector and wherein said x-ray source includes a second x-ray emitter opposingly disposed relative to said second radiation detector.

6. [Original] The imaging system of claim 1, wherein said x-ray source includes a first x-ray emitter opposingly disposed relative to said first radiation detector and said second radiation detector.

7. [Currently Amended] A method of imaging ~~for differentiating material characteristics~~ using a hybrid scintillation/direct conversion imaging system for differentiating material characteristics, the method comprising:

obtaining the hybrid scintillation/direct conversion imaging system, wherein the hybrid scintillation/direct conversion imaging system includes a radiation source and a radiation detector apparatus having a first radiation detector and a second radiation detector, wherein said first radiation detector is a scintillator/photo-sensor detector and wherein said second radiation detector is a direct conversion detector;

operating the imaging system so as to cause said radiation source to emit a radiation beam toward said radiation detector apparatus such that said first radiation detector generates first detector data and said second radiation detector generates second detector data; and

processing said first detector data and said second detector data so as to generate image data.

8. [Original] The method of claim 7, wherein said obtaining includes obtaining an imaging system defining a patient cavity and having a first x-ray emitter opposingly disposed relative to said first radiation detector and said second radiation detector such that said first x-ray emitter is separated from said first radiation detector and said second radiation detector via said patient cavity.

9. [Original] The method of claim 7, wherein said obtaining includes obtaining an imaging system having a first x-ray emitter, a second x-ray emitter and defining a patient cavity;

wherein said first x-ray emitter is opposingly disposed relative to said first radiation detector so as to be separated by said patient cavity; and

wherein said second x-ray emitter is opposingly disposed relative to said second radiation detector so as to be separate by said patient cavity.

10. [Original] The method of claim 7, wherein said obtaining includes obtaining an imaging system having a patient support structure;

wherein said imaging system defines a patient cavity; and

wherein said patient support structure is movingly associated with said imaging system so as to allow said patient support structure to be disposed within said patient cavity.

11. [Original] The method of claim 10, wherein said operating includes associating a patient with said patient support structure and disposing said patient support structure within said patient cavity.

12. [Original] The method of claim 10, wherein said operating includes operating said imaging system so as to cause said radiation source and said radiation detector apparatus to rotate around said patient cavity.

13. [Original] The method of claim 7, wherein said operating includes operating said imaging system so as to cause said radiation beam to pass through a patient.

14. [Original] The method of claim 9, wherein said operating includes operating said imaging system so as to cause said first x-ray emitter to project a first x-ray beam toward said first radiation detector and so as to cause said second x-ray emitter to project a second x-ray beam toward said second radiation detector;

wherein said first x-ray beam passes through a patient so as to generate a first attenuated x-ray beam, wherein said first attenuated x-ray beam is communicated with said first radiation detector; and

wherein said second x-ray beam passes through said patient so as to generate a second attenuated x-ray beam, wherein said second attenuated x-ray beam is communicated with said second radiation detector.

15. [Original] The method of claim 8, wherein said operating includes operating said imaging system so as to cause said first x-ray emitter to project a first x-ray beam toward said first radiation detector;

wherein said first x-ray beam passes through a patient so as to generate a first attenuated x-ray beam, wherein said first attenuated x-ray beam is communicated with said first radiation detector and said second radiation detector.

16. [Original] The method of claim 7, wherein said processing includes super positioning said first detector data and said second detector data so as to create said image data.

17. [Original] The method of claim 7, wherein said processing includes processing said first detector data and said second detector data so as to differentiate between material characteristics, wherein said material characteristics include material type and material density.

18. [Original] The method of claim 7, wherein said processing includes processing said first detector data and said second detector data so as to implement a beam hardening correction scheme.

19. [Original] The method of claim 7, wherein said processing includes processing said first detector data and said second detector data so as to implement an imaging system correction scheme.

20. [Currently Amended] A medium encoded with a machine-readable computer program code for differentiating material characteristics using a hybrid scintillation/direct conversion imaging system, wherein the hybrid scintillation/direct conversion imaging system includes a radiation source and a radiation detector apparatus having a first radiation detector and a second radiation detector, said medium including instructions for causing controller to implement a method comprising:

operating the imaging system so as to cause said radiation source to emit a radiation beam toward said radiation detector apparatus such that said first radiation detector generates first detector data and said second radiation detector generates second detector data, wherein said first radiation detector is a scintillator/photo-sensor detector and wherein said second radiation detector is a direct conversion detector; and

processing said first detector data and said second detector data so as to generate image data.

21. [Original] The medium of claim 20, wherein said operating includes associating a patient with a patient support structure and disposing said patient support structure within a patient cavity.

22. [Currently Amended] The medium of claim ~~23~~-20, wherein said operating includes operating said imaging system so as to cause said radiation source and said radiation detector apparatus to rotate around a patient cavity.

23. [Original] The medium of claim 20, wherein said operating includes operating said imaging system so as to cause said radiation beam to pass through a patient.

24. [Original] The medium of claim 20, wherein said operating includes operating said imaging system so as to cause a first x-ray emitter to project a first x-ray beam toward said first radiation detector and so as to cause a second x-ray emitter to project a second x-ray beam toward said second radiation detector;

wherein said first x-ray beam passes through a patient so as to generate a first attenuated x-ray beam, wherein said first attenuated x-ray beam is communicated with said first radiation detector; and

wherein said second x-ray beam passes through said patient so as to generate a second attenuated x-ray beam, wherein said second attenuated x-ray beam is communicated with said second radiation detector.

25. [Original] The medium of claim 20, wherein said operating includes operating said imaging system so as to cause a first x-ray emitter to project a first x-ray beam toward said first radiation detector;

wherein said first x-ray beam passes through a patient so as to generate a first attenuated x-ray beam, wherein said first attenuated x-ray beam is communicated with said first radiation detector and said second radiation detector.

26. [Original] The medium of claim 20, wherein said processing includes super positioning said first detector data and said second detector data so as to create said image data.

27. [Original] The medium of claim 20, wherein said processing includes processing said first detector data and said second detector data so as to differentiate between material characteristics, wherein said material characteristics include material type and material density.

28. [Original] The medium of claim 20, wherein said processing includes

processing said first detector data and said second detector data so as to implement a beam hardening correction scheme.

29. [Original] The medium of claim 20, wherein said processing includes processing said first detector data and said second detector data so as to implement an imaging system correction scheme.

30. [Currently Amended] A hybrid scintillation/direct conversion imaging system, comprising:

a gantry, wherein said gantry defines a patient cavity and includes a radiation source and a radiation detection apparatus, wherein said radiation detection apparatus includes a first radiation detector and a second radiation detector and wherein said radiation source and said radiation detection apparatus are rotatingly associated with said gantry in an X-Y plane so as to be separated by said patient cavity, wherein said first radiation detector is a different type of detector than said second radiation detector, said second radiation detector configured to count attenuated x-rays and measure the energy of said attenuated x-rays;

a patient support structure movingly associated with said gantry in a Z axis substantially transverse to said X-Y plane so as to allow communication with said patient cavity; and

a processing device, for obtaining data from said first radiation detector and said second radiation detector.

31. [Original] The imaging system of claim 30, wherein said first radiation detector is a scintillator/photo-sensor detector and wherein said second radiation detector is a direct conversion detector.

32. [Currently Amended] The imaging system of claim 30, wherein said first radiation detector is disposed so as to be adjacent to said second radiation detector relative to said Z axis.

33. [Currently Amended] The imaging system of claim 30, wherein said first radiation detector is disposed so as to be non-adjacent to said second radiation detector relative to said Z axis and adjacent thereto with respect to said X-Y plane.

34. [Original] The imaging system of claim 30, wherein said radiation source includes a first radiation emitter opposingly disposed relative to said first radiation detector and wherein said radiation source includes a second radiation emitter opposingly disposed relative to said second radiation detector.

35. [Original] The imaging system of claim 30, wherein said radiation source includes a first radiation emitter opposingly disposed relative to said first radiation detector and said second radiation detector.

36. [Currently Amended] A ~~computer data signal, comprising:~~

~~code configured to cause a processor to implement a~~ method for differentiating material characteristics using a hybrid scintillation/direct conversion imaging system, wherein the hybrid scintillation/direct conversion imaging system includes a radiation source and a radiation detector apparatus having a first radiation detector and a second radiation detector, the method further comprising:

operating the imaging system so as to cause said radiation source to emit a radiation beam toward said radiation detector apparatus such that said first radiation detector generates first detector data and said second radiation detector generates second detector data, wherein said first radiation detector is a scintillator/photo-sensor detector and wherein said second radiation detector is a direct conversion detector; and

processing said first detector data and said second detector data so as to generate image data.

37. [Original] The data signal of claim 36, wherein said operating includes associating a patient with a patient support structure and disposing said patient support

structure within a patient cavity.

38. [Original] The data signal of claim 36, wherein said operating includes operating said imaging system so as to cause said radiation source and said radiation detector apparatus to rotate around a patient cavity.

39. [Original] The data signal of claim 36, wherein said operating includes operating said imaging system so as to cause said radiation beam to pass through a patient.

40. [Original] The data signal of claim 36, wherein said operating includes operating said imaging system so as to cause a first x-ray emitter to project a first x-ray beam toward said first radiation detector and so as to cause a second x-ray emitter to project a second x-ray beam toward said second radiation detector;

wherein said first x-ray beam passes through a patient so as to generate a first attenuated x-ray beam, wherein said first attenuated x-ray beam is communicated with said first radiation detector; and

wherein said second x-ray beam passes through said patient so as to generate a second attenuated x-ray beam, wherein said second attenuated x-ray beam is communicated with said second radiation detector.

41. [Original] The data signal of claim 36, wherein said operating includes operating said imaging system so as to cause a first x-ray emitter to project a first x-ray beam toward said first radiation detector;

wherein said first x-ray beam passes through a patient so as to generate a first attenuated x-ray beam, wherein said first attenuated x-ray beam is communicated with said first radiation detector and said second radiation detector.

42. [Original] The data signal of claim 36, wherein said processing includes super positioning said first detector data and said second detector data so as to create said

image data.

43. [Original] The data signal of claim 36, wherein said processing includes processing said first detector data and said second detector data so as to differentiate between material characteristics, wherein said material characteristics include material type and material density.

44. [Original] The data signal of claim 36, wherein said processing includes processing said first detector data and said second detector data so as to implement a beam hardening correction scheme.

45. [Original] The data signal of claim 36, wherein said processing includes processing said first detector data and said second detector data so as to implement an imaging system correction scheme.